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ABSTRACT

This issue brief discusses the most recent and reliable research on early care and education and its implications for policy making. The brief summarizes recent discoveries about early brain development and then reviews research evaluating: (1) child care; (2) small-scale model early education programs providing enriched services to disadvantaged children; (3) large-scale public school readiness programs such as Head Start; and (4) parent-focused programs (home visiting/parent education). The most significant findings and policy implications noted are: (1) high-quality early care and education programs have proven their effectiveness in improving the developmental outcomes of low-income and disadvantaged children; (2) quality matters; (3) quality is particularly important for children from low-income families; and (4) while parent-focused home visiting/parent education programs have provided some benefits for parents, these have not translated into significantly improved outcomes for children. (Contains 33 endnotes.) (EV)

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Making Investments In Young Children: What the Research On Early Care and Education Tells Us

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Introduction 1

There are times when a convergence of events can focus the public's attention on an issue and elevate it above the array of competing concerns policy makers face at the state level. Over the last few years, the early care and education of children has become such an issue.

Welfare reform has created overwhelming demands on a child care system ill equipped to meet the need without additional support. Despite significant new federal funding for child care and Head Start, the capacity and quality of our system of early care and education continue to be undermined by the limits of what parents can afford, a lack of adequate outside subsidy and the bleeding of qualified staff to higher paying jobs in a time of such low unemployment. State policy makers, in particular, are feeling the pressure to address these problems now that the major responsibility for how public funds should be allocated for ECE services has devolved from the federal to the state level.

On a parallel track, new and widely publicized discoveries about brain development have provided tangible evidence of the influence of the environment on early brain development. At the same time, educators are expressing concern about the increasing number of children who are coming to school without the cognitive and social skills necessary to succeed in school, and later in life.

As a result, state policy makers, hoping to reach children during the most formative period of brain growth, have enacted ECE initiatives at an unprecedented rate. Unfortunately, too often they have had to do so in a vacuum, aided by little more than anecdotal evidence about what works and what doesn't work in enhancing the development of children. We know enough now to avoid such guesswork. A large body of more rigorous ECE research has been conducted over the past decade which provides a clearer direction to policy makers.

This issue brief discusses the most recent and reliable research on early care and education (ECE) and its implications for policy making. In the following pages we will briefly summarize recent discoveries about early brain development and then review research evaluating child-focused, out-of-home ECE programs (child care, small-scale model early education programs providing enriched services to disadvantaged children, and large-scale public school-readiness programs such as Head Start), as well as parent-focused programs (home visiting/parent education).

These programs may have been designed to serve a number of purposes, but in this brief we focus only on what the research tells us about their impact on the development of children. To determine this, researchers use "child outcome" measures which assess cognitive skills, language development, social skills and school achievement, as well as rates of grade retention, placement in special education and high school graduation. Other measures used in studies in which children are followed into adulthood include rates of employment, college enrollment, pregnancy, arrests and other such "life course" measures.

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ISSUE Brief

What Research Tells Us About the Importance of the Early Years

In the last decade, there has been an explosion of new knowledge about the early development of the brain. The dramatic nature of these discoveries has attracted wide public attention. The focus of much of this research is on the earliest years of life. During this time of rapid brain growth, we now know that the early environment of a child has a greater influence on the development of cognitive and emotional skills than was previously thought.[1]

New tools allow scientists to see the impact of a child's experiences on the physical structure of the brain as it develops. Researchers have found, for example, that high levels of certain hormones released when infants are under stress can change the structure of the brain in ways that undermine a child's ability to learn and to regulate his or her emotions. As a result, infants who are under continuous stress are more likely to suffer from learning and behavioral problems. These hormone levels are reduced, however, when infants are cared for by warm and sensitive caregivers.[2]

The study of the human brain has not developed enough yet to allow us to draw clear conclusions about the critical times in childhood when different skills are best acquired, nor exactly what stimuli is needed to acquire them. Yet certainly the overwhelming message from this new knowledge is that if we intervene in the early years, beginning even in infancy, disadvantaged children will have the best chance to overcome obstacles to healthy development.[3] The research outlined here, which looks at the impact of ECE-programs on child outcomes, seems to confirm this finding.

Which ECE Interventions Work?

The most rigorous ECE research sends the overarching message to policy makers that child outcomes can best be improved through out-of-home ECE programs which focus directly on the child, *provided these programs are of high quality.*[4] While the research continues to support the primary influence of parents on children's development,[5] the need for out-of-home care remains a reality. Two-thirds of mothers of children under six are in the labor force.[10] The most recent research underscores the significant impact of quality in these out-of-home ECE settings on children's development, especially for disadvantaged children.[11]

The research is less positive about the effectiveness of a number of parent-focused programs which use home visitors to educate parents about the developmental needs of their children and help them with referrals to needed services. While these have been established for a variety of purposes, policy makers have been especially interested in the potential of these programs to improve the developmental outcomes of children. This expectation is based on the intuitive sense that if changes were brought about in parenting practices and knowledge, this would translate into developmental gains for at risk children. Unfortunately, the most reliable studies of these programs do not support this assumption.[12]

The Impact of Model ECE Programs

The Research:
The two most significant and rigorous studies in the research on ECE model programs are the Abecedarian Project (which enrolled children in infancy) and the High/Scope Perry Preschool Project (which enrolled children at age three).[13] These child-focused programs provided an intensive, high quality ECE program aimed at improving the developmental outcomes of disadvantaged children.

Both of these studies used an experimental design (see sidebar on research design) and involved tracking and comparing disadvantaged children who had been in the program with a comparable group who had not. The children studied have now reached adulthood.

For policy makers, the most significant findings and policy implications from a decade's worth of rigorous ECE research are:

- **Quality early care and education programs have proven their effectiveness in improving the developmental outcomes of low-income and disadvantaged children.** These programs produce long-term as well as short-term gains both on measures of school achievement and success in young adulthood.[6]
- **Quality matters.** If improved outcomes for children are to be achieved, any program of early care and education must meet adequate standards of quality and must be provided with enough funding to do so without inflating the cost paid by parents.[7]
- **Quality is particularly important for children from low-income families.** Disadvantaged children are harmed more by poor quality care and benefit more from high quality care than children from middle- and upper-income families.[8]
- **While parent-focused home visiting/parent education programs have provided some benefits for parents, these have not translated into significantly improved outcomes for children.** As a result, researchers advise a reassessment of home visiting as an approach to enhancing the development of at-risk children and urge policy makers to have clearer goals and more modest expectations for these programs.[9]

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Findings:

- **Compared to a control group, participating children in these studies were more successful in school.** They scored higher on school achievement tests; were less likely to be retained in grade or placed in special education; and were more likely to graduate from high school.
- **In young adulthood, they continued to experience more success.** They were more likely to delay a first pregnancy, more likely to become employed and more likely to attend a four year college. Those who attended the Perry Preschool Program also were less likely to have been arrested.
- **For the Perry Preschool Program, researchers conducted a cost benefit analysis which found that for every $1 spent, an estimated $7.16 was saved in lower public expenditures for welfare, education and other services.**[14]

The Impact of Head Start and Other Public ECE Programs

The Research:
This body of research focuses on Head Start and other large-scale public ECE programs designed to boost the development of disadvantaged children. Because of funding limitations, these ECE programs, while generally superior to the typical child care program, still do not approach the quality and intensity of services provided in the model programs cited above.[15] Within these programs, there is also a wide range of quality from site to site.

Because of the nature and size of the programs examined here, these studies were less rigorous in design (although all used a comparison group of children who did not receive services) than the research on the model programs discussed above (see sidebar on research design.) Nevertheless, the benefits found in these studies, while not of the same magnitude as those found in the model programs, are significant enough to add weight to the evidence in support of quality out-of-home ECE programs.[17]

What Is Quality?

The following are some of the most important factors that define quality in ECE programs.[16]

- Warm, sensitive and responsive interactions between caregiver and child. This factor is considered the cornerstone of quality.
- Small group-size and high staff/child ratios.
- Stable, consistent relationships with a limited number of caregivers.
- Qualified, trained staff.
- Stimulating activities which support learning through play and are appropriate to the age of the child.
- A safe and supportive physical environment.
- Adequate nutrition and protection of children's health.

Findings:

- **Head Start and other similar public programs do make a difference!** The weight of the evidence indicates that large-scale preschool programs like Head Start do have a lasting beneficial effect on measures of school achievement and rates of grade retention, special education and graduation from high school.[18]
- **The benefits of Head Start do not fade out.** Contrary to the widely held belief that the benefits of Head Start fade out as children go through school, a recent analysis of the research suggests that with the exception of IQ scores, the benefits of Head Start do persist throughout the later grades even when children attend poor quality primary schools.[19]

These findings recommend Head Start and similar programs as effective models for state-funded preschool initiatives. However, the gap between the benefits found in the model programs discussed above and those from Head Start may mean that with greater support and stronger standards, Head Start could have a greater impact. To accomplish this, more funding is needed both to boost the quality and intensity of services and to extend services to more children.[20]

The Impact of Quality On Children In the Range of Settings of Care In Our Current ECE System

The Research:
It is one thing to determine whether high quality model programs make a difference in the outcomes of disadvantaged children. But does quality also matter in the array of different child care settings found in the ECE system as a whole and does it affect the outcomes for children from a range of family incomes and circumstances?

The two most important studies here are the Study of Early Child Care of the National Institute of Child Health and Human Development (NICHD) and the Cost, Quality and Outcomes (CQO) study conducted by a number of academic research institutions led by the University of North Carolina at Chapel Hill.[21] Both studies were done at multiple sites in different states. Unlike the research cited above, these studies did not use randomized trials but instead examined in depth the ECE system *as it exists in the community*, and the cross section of families it serves. (See sidebar on research design for an explanation of the limitations of this type of research.)

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Findings:

- **Again, quality matters!** The study found that the home environment and the relationship between mother and child seem to have the greatest influence on children's outcomes.[22] Nevertheless, researchers found that the quality of the child care children receive is significantly related to better outcomes for children's development.[23]
- **Higher quality programs benefit children.** Higher quality care is associated with better mother/child relationships, fewer reported behavior problems and better scores on measures of cognitive and language skills and school readiness among children from a wide range of backgrounds.[24]
- **Poor quality care can harm children.** Poor quality care is associated with poorer relationships between mothers and infants, more problem behaviors, and lower cognitive, language and school readiness scores.[25]
- **Disadvantaged children gain the most from high quality care. They are also harmed the most if they are in poor quality care.**[26] The research suggests that the children who are probably most at risk in our child care system are the children from near-poor families whose mothers must work many hours to pull the family out of poverty and who do not qualify for publicly subsidized child care because their family's income is too high. They are more likely to be in poorer quality care, for longer hours and they begin care earlier, before the age of three months.[27]
- **The benefits of quality child care last.** Child care quality continues to exert an influence on child outcomes at least through kindergarten (for language ability and sociability) and in some cases through second grade (for math ability, thinking/attention skills and problem behaviors). To date, the highest grade for which results are available in this body of research is second grade (in the CQO study). As a result, we don't yet know if these benefits will persist through the later grades.[28]

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Research Design: How Do We Know What Research We Can Trust?

Research design may seem far afield from the concerns of policy makers. However, there have been enough examples of findings from poorly conducted research being used to influence public policy that policy makers are right to be wary of the information given them. Certainly, the recent trend toward more evidence-based policy making is a reflection of that concern. Policy makers need to know what questions to ask before deciding whether the findings being cited are reliable enough to be used as a basis for decision making.

Research designs vary depending on the purposes of the research and the size and complexity of the programs and populations being examined. The differences between methodologies are important because they dictate how these studies can legitimately be used to draw conclusions about the effectiveness of various ECE interventions.

Studies using what's termed an "experimental design" offer the most reliable evidence about the effectiveness of a program. In an experimental design, researchers randomly assign individuals from the same population to a treatment group and a control group and then compare the two groups on outcomes related to the purpose of the program being evaluated. Without a control group, researchers may be able to assess the development of children in a program during and after the time when services were provided, but they have no way of determining whether those results were actually caused by the intervention.

These experimental design studies, often referred to as the "gold standard" of research methodology, produce findings which permit policy makers to target resources more effectively and they can often set the standard for quality policy makers should strive for when model programs are being replicated on a larger scale. They also can help policy makers avoid investing in programs which are less likely to produce the intended outcomes.

Once the effectiveness of a given approach is established through use of an experimental design, larger-scale studies, though less rigorous, are often very useful in providing answers to the many questions that come up when a model program is being replicated in the field because of the breadth of their scope and detail. They are also useful in determining whether the quality and intensity of the larger-scale effort matches that of the model. If it doesn't, then policy makers can't expect the same results for children. Lastly, these studies are useful for inquiring in depth about large-scale, complex systems as they exist naturally in the community.

There are inherent trade-offs between the two kinds of studies. Experimental design studies produce the most credible evidence that a program is effective in achieving its intended goal. Large-scale studies, while unable to prove causation, can help with evaluating replication efforts and with obtaining a more detailed picture of the full complexity of systems of care across a variety of settings and populations served.

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The Impact of Parent-Focused Programs On Children's Development

The Research:
The Packard Foundation published an analysis of research evaluating six home visiting/parent education programs: Hawaii's Healthy Start, Healthy Families America, (HFA) The Nurse Home Visitation Program (NHVP), Parents as Teachers (PAT), The Home Instruction Program for Preschool Youngsters (HIPPY) and the Comprehensive Child Development Program (CCDP).[5]

These studies were among the few evaluating the impact of home visiting programs to use rigorous, randomized trials (see sidebar on research design). As a result, they are the most reliable in determining the effectiveness of parent-focused programs for enhancing the development of children.

Findings:

- **Parent education/home visiting programs which focus on the parents are not an effective way to improve the developmental outcomes of children.** The evidence to date on whether such parent focused strategies can improve children's outcomes has been mixed and suggests that such approaches are not an effective way to reach at-risk children and enhance their development.[6]
- **Changes noted in the parents as a result of home visiting did not seem to lead to changes in the children's development.** Some benefits for parents were found (in parenting practices, attitudes and knowledge.) However, the intended gains in children's outcomes that were supposed to result from these changes in the parents (in health, development or abuse and neglect) were "more elusive."
- **Results were modest and inconsistent.** Where benefits were found, they usually were true only for certain populations and these were not consistent from site to site. Only rarely did they occur for all of the program goals and they were quite modest in magnitude.[7]

While the researchers for the Packard report did not examine programs that combine quality out-of-home ECE programs with home visiting, they did raise the possibility that when intervention services are delivered in this combination, home visiting might add value to the mix. Unfortunately, there is no rigorous research to date that can give us a reliable answer to this question; this may be an important line of inquiry for researchers in the future. (See endnote for a discussion of recent research on this issue)[8]

The researchers who did the analysis urge policy makers to have modest expectations for this service strategy and recommend a reassessment of any expansion of home visiting in light of these findings. They advise targeting services only to those families which research demonstrates can benefit, rather than making them available universally. They also point out that home visiting now may be a less efficient strategy because so many more low-income mothers are employed outside the home.

> **"The importance of high quality, educational child care from early infancy is now clear. The Abecedarian Study provides scientific evidence that early childhood education significantly improves the scholastic success and educational attainments of poor children even into early adulthood."[9]**

Where Do We Go From Here?

No one program can overcome the effects of poverty on children's development. There is no "magic bullet." We do know, however, that out-of-home high quality ECE programs can produce significant gains for children. We also know that these gains can lead to greater success in school and in early adulthood. It has not been shown that services which focus only on the parents translate into significant developmental gains for children. If this is our goal, the research justifies bold action to expand and improve services for one strategy, and suggests a more cautious reassessment of the other.

The public spotlight is on ECE. Welfare reform and a strong economy have enabled many more low-income mothers to find jobs, creating enormous demands on our ECE system. At the same time, significant advances in our knowledge about early brain development have coincided with a growing concern over the degree to which children are coming to school without the skills needed to succeed. These are compelling reasons for acting now to enhance the environments of at-risk children.

The findings of the rigorous ECE research cited here inevitably point to new questions that need answering as we fine tune our approach to improving the outcomes of at-risk children. Enough is known now, however, to allow policy makers to move ahead with confidence. No approach should be dismissed without an effort to assess where and how it might help, but we can no longer afford to spread our scarce dollars so thinly and get such uneven results in return. Certainly, we must realign our priorities to address the needs of children; but we must do so in a way that maximizes the impact of every dollar we spend based on what credible research tells us is the wisest investment.

Given the requirements and uncertainties of a global economy and the financial strains that will be placed on our government by an aging population, so much depends on the capabilities of the young children of today. So many of our children living in or near poverty are not receiving the help they need. Because they are growing and changing every day, they simply can't afford to wait, and neither can we. ■

Endnotes

1 Rima Shore, *Rethinking the Brain: New Insights into Early Development* (New York City: Families and Work Institute, 1997).

2 Megan Gunnar, "Quality of Early Care and Buffering of Neuroendocrine Stress Reactions: Potential Effects on the Developing Human Brain", *Preventive Medicine, 27 No. 2 (March/April 1998).*

3 Shore, *Rethinking the Brain.*

4 Frank Porter Graham Child Development Center, *Early Learning, Later Success: The Abecedarian Study, Executive Summary*, (Chapel Hill: University of North Carolina at Chapel Hill, 1999); L.J. Schweinhart et al., *Significant Benefits: The High/Scope Perry Preschool Study Through Age 27*, Monographs of the High/Scope Educational Research Foundation,10 (Ypsilanti: High Scope Press, 1993); S.W. Barnett, "Does Head Start Have Lasting Cognitive Effects?" chapter in forthcoming book, E. Zigler and S. Styfco, eds., *The Head Start Debates* (New Haven: Yale University Press).

5 Frank Porter Graham Child Development Center, *The Children of the Cost, Quality and Outcomes Study, Executive Summary* (Chapel Hill: University of North Carolina, June 1999); J. Currie, "Early Childhood Intervention Programs: What Do We Know?" (Los Angeles: UCLA and NEBER, 2000); National Institute of Child Health and Human Development, *The NICHD Study of Early Child Care* (Washington D.C.: National Institutes of Health, 1998) NIH Pub. No. 98-4318.

6 Ibid.

7 D. Gomby, P.L. Culross and R.E. Behrman, *Home Visiting: Recent Program Evaluations - Analysis and Recommendations, Future of Children 9, No. 1* (Los Altos: Packard Foundation, Spring/Summer, 1999).

8 Frank Porter Graham Center, *Abecedarian, Exec. Sum.*; Schweinhart, *High/Scope, Barnett, Head Start.*

9 NICHD, *Early Child Care.*

10 U.S. Department of Labor, Women's Bureau, "20 Facts on Women Workers", March, 2000, found at http://www.dol.gov/dol/wb/public/wb_pubs/fact98.htm.

11 NICHD, *Early Child Care*; Frank Porter Graham Center, *Cost, Quality and Outcomes.*

12 Gomby, *Home Visiting.*

13 Frank Porter Graham Center, *Abecedarian, Exec. Sum.*; Schweinhart, *High/Scope.* See studies for details about the magnitude of the gains.

14 S.W. Barnett, *Lives in the Balance: Age - 27 Benefit-Cost Analysis of the High/Scope Perry Preschool Program*, Monographs of the High/Scope Educational Research Foundation 10 (Ypsilanti: High/Scope Press, 1996).

15 Currie, "Early Childhood Intervention."

16 E. Galinsky, D.E. Friedman, *Education Before School: Investing in Quality Child Care* (New York City: New York Scholastic, 1993); NICHD, *Early Child Care*; E. Galinsky, "What Really Constitutes Quality Care?", *Child Care Information Exchange* (September 1986).

17 Barnett, *Head Start.* The findings and conclusions cited in this section are from Barnett's forthcoming chapter summarizing and analyzing 39 of the most rigorous studies of Head Start and other preschool programs designed to enhance the development of disadvantaged children.

18 Ibid.

19 Ibid. Researchers who did this analysis identified methodological flaws in the studies which found that gains in school achievement faded out in the later grades. The failure to test students in the later grades who had been placed in special education or who had been retained in grade, had the effect of underestimating the differences in scores between the Head Start children and the control group. Because the control group had higher rates of special education and grade retention, excluding these students may have inflated the average scores of the control group.

20 Ibid.

21 NICHD, *Early Child Care*; Frank Porter Graham Center, *Cost, Quality and Outcomes.* The first study followed children from birth and assessed the quality of the range of care settings their parents chose throughout the preschool years. The second examined children enrolled in child care centers, assessed the quality of those centers, and then followed the children into elementary school.

22 NICHD, *Early Child Care.*

23 NICHD, *Early Child Care*; Frank Porter Graham Center, *Cost, Quality and Outcomes.*

24 Ibid.

25 NICHD, *Early Child Care*; Frank Porter Graham Center, *Cost, Quality and Outcomes.*

26 Ibid.

27 NICHD, *Early Child Care.*

28 NICHD, *Early Child Care*; Frank Porter Graham Center, *Cost, Quality and Outcomes.*

29 Gomby, *Home Visiting.*

30 Other forms of parent-focused interventions also have not produced significant gains for children. For example, case management and care coordination services designed to help families access services in their community had little effect on family's use of services and produced no developmental gains for children. R.G. St. Pierre, et al., *The Effectiveness of Comprehensive Case Management Interventions: Findings from the National Evaluation of the Comprehensive Child Development Program* (Cambridge: Abt Associates, September, 1997); R.G. St. Pierre and J. I. Layzer, "Improving the Life Chances of Children in Poverty: Assumptions and What We Have Learned", *Social Policy Report*, XII (1998) 4.

31 Only one of the home visiting programs studied, The Nurse Home Visitation Program, used public health nurses as home visitors, started home visiting before birth and had the goal of reducing smoking during pregnancy and improving birth outcomes, as well as improving child development outcomes. While the program did produce some results on the first goal among the neediest served (low-income, unmarried women), it did not produce significant gains on child development outcomes. An exception was the reduction of the neurodevelopmental impairment associated with smoking among children of mothers who had smoked and reductions in E.R. visits for injuries, child abuse and neglect incidents and some "risky behaviors" in adolescence. This may indicate that public health-related indicators are easier to influence through home visiting than are children's developmental outcomes and that use of nurses rather than paraprofessionals is important to that success. See D.L. Olds, et al., "Prenatal and Infancy Home Visitation by Nurses: Recent Findings", in Gomby, *Home Visiting* for a fuller discussion of this program.

32 Some proponents of home visiting are pointing to a new study from St. Louis, MO, as demonstrating that when the PAT home visiting program is combined with a child care center and/or preschool experience, children do better than the children who only are in out-of-home care. However, this study did not use a rigorous experimental design (see sidebar on research design) nor did it make any assessment of the quality of the various out-of-home ECE programs the children were in. Thus, it is impossible to determine with any reliability whether it was the home visits that produced the higher scores among children who received both services as opposed to a difference in the quality of their preschool experiences or some other unrelated factor. J. Pfannenstiel, *School Entry Assessment Project: Report of Findings*, Research and Training Associates (St. Louis: Missouri Department of Elementary and Secondary Education, 1999).

33 Frank Porter Graham Center, *Abecedarian.*

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